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ABSTRACT

This report reviews the increasing numbers of case studies, technical guides, and theory-oriented reports that bear on the successful diffusion of new instructional programs and their local adoption. The author separates these reports and articles into four categories: (1) case studies of educational innovation diffusion, (2) theory-oriented studies that draw upon particular instances of educational innovation to determine factors that influence successful diffusion and adoption of innovative programs, (3) studies that focus on particular school personnel as determinants of program diffusion and adoption, and (4) reports that define local, State, and national communication networks as agents of adoption and diffusion. A selected bibliography is included. (Author/JF)

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REVIEW OF RECENT LITERATURE ON EDUCATIONAL DIFFUSION RESEARCH*

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Increasing numbers of case studies, technical guides, and theory-oriented reports are appearing that bear upon the successful diffusion of new instructional programs and the fostering of their local adoption. This review of recent literature distinguishes these reports and articles in four categories: (1) case studies of educational innovation diffusion, (2) theory-oriented studies that draw upon particular instances of educational innovation to determine the factors influencing their successful diffusion and adoption, (3) studies that focus on particular school personnel as determinants of innovation diffusion and adoption, and (4) reports that define local, state, and national communication networks as agents of adoption and diffusion.

Case Studies of Educational Innovation Diffusion and Adoption

Reports of ten studies describe specific innovative instructional programs and outline procedures for their successful adoption at the local level.

Feldhusen and Szabo (1969) regard CAI, or the computer-assisted instruction movement, as the major educational development of the late 1960s and early 1970s. Their extensive review of the literature amounts to a substantive discussion of the problems involved in the successful adoption of CAI. Information sources on CAI are described; the theoretical bases for CAI and programmed instruction, its closely related antecedent, are discussed; and a bibliography of sixty-one items on the development and adoption of the growing range of CAI programs is included.

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Fox and Lippitt (1967) reported on a project involving a state teachers organization and teacher teams in local school systems to demonstrate new teaching practices. The study indicated the needs for a vastly improved flow of information to teachers about available resources, for positive interpersonal relations among teaching colleagues, and for inservice education activities to develop a climate supportive of innovation.

Geis (1968) outlined a program for the training of Instructional Systems Consultants as change agents to guide continuing, systematic innovations in the field of foreign language instruction.

Green (1966) described a two-year project sponsored by the Colorado State Department of Education to increase the use of new audiovisual instructional media by Colorado schools. Dissemination procedures included are multimedia demonstration, workshops, team visitations, a twelve-week course in media utilization, and a follow-up consultation service. Results of the project, differentiated by types of dissemination procedures, included an increase in the number of audiovisual directors, a liberalization of equipment purchasing policies, an increase in clerical assistance, and a favorable change in teacher opinions.

Mayhew (1967) discussed some of the new techniques and practices for generating change in colleges and universities including use of television and other audiovisual media, flexible class scheduling, new grading methods, interdisciplinary courses, independent study, and cooperative work programs. Adoption of innovations will be expedited especially by faculty workshops and strong administrative support.

Peluso (1968) described the successful adoption by twenty-five schools in the Chicago area (twenty-three high schools and two colleges) of Operation COMPU/TEL, a time-sharing computer network designed to give practical experience in learning computer skills at relatively low cost. Lectures, demonstrations, and teacher workshops were used to inform both students and faculty of the importance of learning data

processing and the possibility of computer-oriented learning, especially at the secondary level.

The Texas Small Schools Project (1969) sought to improve education through talented-youth seminars, health career days, multiple classes, supervised correspondence courses, nongraded elementary classes, flexible scheduling, team teaching, and student science demonstrators. The report includes a discussion of implementation activities.

Assessing the man-machine interface in the Palo Alto, California, Unified School District, Tondow (1967) explicated the systems approach and the use of computer-based information services as increasingly important to the successful adoption of educational innovations.

Valencia (1969) reported on sixteen selected educational and community programs for Spanish-speaking people in the South and Southwest, with an assessment of each program and recommendations for dissemination and implementation of the project model. Innovative programs include bilingual education, a video-oral English instructional approach, and an adult training center.

The Wayne County Intermediate School District (1968) reported on a curriculum development project designed to identify, develop, and test objectives and strategies to change educational programs in a suburban junior high school and an innercity senior high school, seeking to identify, create, and implement useful and satisfying experiences for delinquent as well as nondelinquent students.

Theory-Oriented Studies

In the area of theory and practice, a number of writers have drawn upon particular instances of innovation and adoption to define and illustrate critical aspects of the diffusion-adoption process in the field of education.

Carter (1966) compared diffusion efforts in education with those in other fields, especially the military. Studies have demonstrated that (1) the transition from research to development to use is not a straight-forward process, (2) interpersonal communication among successful innovator-adoptors is inclined to be informal and largely on a person-to-person basis, (3) strong leadership is essential, (4) funding is loosely controlled, and (5) the organizational environment is adaptive rather than authoritarian. Carter described instances of successful and unsuccessful procedures for adoption and related the essentials of the traveling seminar project, more fully reported by Richland (1966).

One of the most comprehensive efforts to determine effective ways to accomplish the widespread adoption of educational innovations is described by Richland (1965). A nationwide study was conducted by the System Development Corporation, under a contract awarded by the U.S. Office of Education, to evaluate the traveling seminar technique as an effective dissemination activity. During the period of May 11-15, 1964, visits were made by four groups, each comprised of thirty educational administrators and a tour leader, to school sites with outstanding innovations, located in four regions of the United States--southern, eastern, midwestern, and western. Immediately following the site visits the four groups of educators met for a second week at the SDC facility at Santa Monica, California, where they were joined for a review of the traveling seminars by consultants, SDC specialists, and key innovators from the schools visited.

Study results reported by Richland include: (1) The traveling seminar and followup conference procedure clearly facilitate the effective dissemination of educational innovations, (2) measurable attributes of school districts relate to their innovative behavior, and (3) the local superintendent's attitude toward innovation is a significant variable in the introduction of innovations in school districts. The

report describes the development of the project and includes a statistical analysis of data derived by questionnaires, interviews, and observations. Among the many innovations observed were team teaching, continuous progress plan, ungraded high school, language laboratories, closed circuit educational television, flexible scheduling, educational media center, and programmed instruction.

Nemi and Rogers (1968) call for enlarging the scope of diffusion research to include more dependent variables dealing with innovation consequences, the social system, and communications. Furthermore, the authors contend that utilizing such methodological advances as rational analysis and the study of structural affects in the study of educational diffusion will not only result in a better insight into human behavioral change in an organizational setting, but will have implications for more rapid educational diffusion as well.

Nan (1968) examines the research methods generally utilized in diffusion research and suggests those which might help provide a better understanding of the diffusion process: field experiment, computer simulation, and structural analysis (the relationships between the various properties of group structure and innovation diffusion indexes). Structural analysis has possible implications for policy makers attempting to bring innovations to educational organizations because it can be used (1) to provide information about the optimum process for disseminating new ideas and practices, (2) to assess the compatibility between the formal and informal structures within the system, and (3) to improve the structure of innovation assimilation.

Carlson (1968) summarized and evaluated research on adoption and diffusion of educational innovations with emphasis on the deficiences of past research. In 1964, Mort summarized the findings of about 200 studies of the adaptability of school systems.

Lippitt (1966) suggests a model for adequate dissemination of research findings which takes into consideration four major barriers to effective communication:

(1) division of labor into task goals, (2) institutional distinctions, (3) development of professional reference groups, and (4) geographical divisions. To overcome these barriers, Lippitt suggests the following solutions: linking systems and roles, specialized communications media, and the development of new inclusive systems which enable researchers and practitioners to be parts of the same organization.

Guba (1967) attributes the unsatisfactory operation of the diffusion function of the theory-practice continuum to the lack of an acceptable strategy. To remedy this situation, Guba recommends a four-part strategy containing the following elements: (1) assumptions concerning the nature of the practitioner who will be exposed to the strategy, (2) assumptions concerning the end state in which one wishes to leave the practitioner, (3) assumptions about the nature of the agency or mechanism carrying out the diffusion activity, and (4) assumptions concerning the substance of the invention.

Investigating the linking roles in the dissemination and utilization of knowledge, Havelock (1967) examines three issues concerning their institutional contest: (1) institutional barriers which affect knowledge dissemination and utilization, (2) types of linking agents which most effectively support and control linking roles, and (3) institution types which serve as linkers.

Pellegrin (1966) discussed the conditions under which educational innovation can occur and the changes that must be made to tie together knowledge and practice. In a later work (1968) he showed that effective innovation must be preceded by fundamental changes in educational organization.

In a study that examined current thought concerning the role of mass communication and economic development in developing nations, Brown (1968) analyzes exisintg efforts to diffuse agriculture technology in Chile, assesses the effectiveness of various approaches, and tests the effects (primarily on knowledge levels) of an experimental technical information service for Chilean farmers. The major findings of Brown's

study are as follows: (1) effective programs have offered credit in marketing services as well as technical information; (2) compulsion, in the form of contractual obligations and credit control, appears to hasten adoption; (3) literates, especially opinion leaders, were more active than other groups in secondary diffusion; (4) independent farmers tended to try new practices more than other tenure groups; (5) illiteracy, lack of education, and so-called traditional attitudes were not insurmountable barriers to reception of technical informatipn; and (6) personality factors may be less important than other situational variables in determining response to efforts to introduce new technology.

Rogers (1968a) discussed the problems of successfully adopting innovations in the large modern university. He outlined five strategies for change to speed up the diffusion process, the primary objective being a self-renewing university.

Gross and others (1968) reported on an extensive seven-month field study to determine the theoretical bases for the implementation of a major innovation in an elementary school--a new role for teachers who were to serve as catalysts for pupil learning. The study determined that the implementation of an innovation may be a function of six basic conditions: (1) the degree to which members of an organization have a clear understanding of an innovation, (2) the extent to which they are capable of behaving in accordance with new role expectations required by the innovation, (3) their willingness to make the necessary effort, (4) the degree to which the required materials and equipment are available, (5) the degree to which organizational arrangements are compatible with the innovation, and (6) the degree to which management carries out its responsibilities in the implementation phase of an innovation.

Moore and Mizuba (1969) briefly review a number of successful and unsuccessful diffusion efforts in fields other than education. They sought to demonstrate to the educational practitioner as a diffusing agent the importance of (1) establishing an

acceptable image of the innovation's source, (2) effectively communicating the innovation's objectives and functions, and (3) incorporating the nature of the receiver into the diffusion process.

Havelock (1969) isolates seven factors that are highly related to successful dissemination and utilization of knowledge: (1) linkage to internal and external resources; (2) degree of structure in resource system, user, message and medium; (3) openness of user and resource systems; (4) capacity to marshal diverse resources; (5) reward; (6) proximity to resources and other users; and (7) synergy (the variety, persistence, and synchronization of messages and media).

School Personnel as Determinants of Innovation Adoption

As educational innovations have been introduced into particular schools and school districts, studies have been conducted to determine the degree to which various members of the educational community influence the successful adoption of these innovations. Of primary importance are the characteristics and behaviors of school superintendents and teachers, with school board members and the community at large occupying a secondary role.

Carlson (1965), in Adoption of Educational Innovations, analyzed the rates of adoption of educational innovations in terms of qualities of innovations, stages of adoption, and characteristics of innovators. He concluded that the rates of adoption and diffusion of innovations are only partly accounted for by the nature of innovations and innovators.

Guba and Clark (1967) examined the educational change process from production of new knowledge to implementation of new practices, and presented sixteen recommendations to facilitate change.

Carlson (1965), Keil (1969), and Kohl (1969) stressed the role of the superintendent

and the administrative structure in the successful adoption of an educational innovation. Edgarton (1969), McCarthy (1969), and Nussel and Johnson (1969) focused on the importance of the teacher's role and the need to identify the innovative teacher as well as to develop both peer and administrator support for the implementation of new approaches to improve the classroom learning environment. Christie and Scribner (1969) identified characteristics and behaviors of superintendents, teachers, and board members that are positively related to the successful adoption of educational innovations.

In a social-psychological analysis of research utilization in educational administration, Schmuck (1967) views unproductive researcher-administrator relationships as characterized by poor communication, negative stereotypes researchers and administrators hold of each other, and distrust and suspicion supported by the inconsistent norms of each one's reference group. Schmuck lists ten clusters of social-psychological assumptions for building connections between the production of research knowledge and the improvement of administrative practice in education.

Williams and Hull (1968) found diffusion of innovative practices to be significantly correlated with teacher innovativeness.

Reynoldson (1969) investigated the interrelationships between the decision-making process and the innovativeness of public schools. His study's findings indicate that the educational decision-making structure (centralized or decentralized) does not measurably influence decisions of professional staff members to adopt innovative practices. However, more innovation was found in schools with greater openness of organizational climate. Reynoldson concluded that factors such as personality characteristics of the administrator, his willingness to adopt innovative ideas, his leadership style, and the diffuseness of the communication network may have more influence on decisions to adopt innovative ideas than the structure of decision making.

In a study to determine the diffusion of educational innovations to urban-rural government secondary schools of Thailand and to the teachers within these schools, Rogers (1969) found that: (1) younger teachers tended to become aware of innovations first, (2) teachers with high exposure to mass media tended to adopt innovations earlier, (3) women teachers were more likely to view innovations as beneficial, (4) principals who had traveled abroad usually became aware of innovations earlier (5) schools with principals who were older men and had traveled abroad tended to adopt innovations before other schools, and (6) principals who saw themselves psychologically close to their faculty viewed innovations as beneficial.

Hensel and Johnson (1969) examined the opinion leadership phenomenon as an element of a change strategy for agriculture education.

Local, State, and National Communication Networks

The Michigan State Board of Education (1967) conducted a study to identify a communication network to shorten the lag time in adopting educational innovations in vocational education.

The Inter-Governmental Task Force on Information Systems (1968) found a number of factors hindering the development of an efficient information flow within and among federal, state, and local governments: (1) the lack of strong, central coordination at all levels of government over the development and operation of internal information systems; (2) the fragmentation of federal grant-in-aid programs which are available to assist state and local governments in the development and operation of information systems; (3) the lack of adequate coordination among separate federal and state programs which impose requirements for socioeconomic data upon the lower levels of government; and (4) the lack of appropriate consultation by federal and state agencies with lower levels of government prior to imposing requirements for information.

The winter 1970 issue of the Journal of Research and Development in Education is devoted to a review of the principles and practices of the fifteen federally funded regional educational laboratories. Three articles particularly relate to the diffusion of educational innovations. Becker described the diffusion strategies of seven regional laboratories, defining the primary criteria and factors concerned with the diffusion of individually prescribed instruction in mathematics at the elementary school level. Schmidtlein refered to twelve programs being developed by the laboratories as "programs to assist educational institutions to adopt and effectively utilize improved practices," appending a list of the laboratories with their addresses and specific developmental programs. Schutz identified major components in the development of a new instructional practice, stressing the primary responsibilities and interrelationships of significant persons in the total development process.

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